

EFFECT OF INORGANIC NUTRIENTS AND COMBINE EFFECT OF INORGANIC AND ORGANIC SOURCES OF NUTRIENTS ON QUALITY OF GUAVA (*Psidium guajava* L.) CV. G-27

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ABSTRACT

A field experiment was conducted at University orchard farm, Department of Horticulture (Fruit Science), College of Agriculture, Gwalior (M.P.) during 2014-15 to find out the effect of inorganic nutrients and combine effect of inorganic and organic sources of nutrients on quality of Guava (*Psidium guajava* L.) cv. G-27 cv. Gwalior 27 in Randomized Block Design (FRBD) with thirteen treatments replicated thrice in a well established guava orchard. Application of nutrients irrespective of their sources and doses, markedly enhanced quality of guava fruits over untreated control. There were four levels of Nitrogen i.e., 600 g, 450 g, 300 g and 150 g., four levels of Phosphorus i.e., 400 g, 300, 200, 100, four levels of Potash i.e., 600 g, 450 g, 300 g and 150 g., plus 5 Kg vermicompost and 10 Kg FYM was applied per plant while the control plants received no fertilizer, inoculation and manure treatment. The quality parameters like fruit volume (203.67 ml), no. of seed per fruit (304.00), seed weight (8.52 g), pulp weight (196.93 g), pulp: Seed ratio, TSS (11.17° Brix) and acidity (0.22) content were significantly higher in treatment T5 (Nitrogen @ 600+ Phosphorus @ 400+ Potash @ 600+ Vermicompost @ 5 kg/plant).

KEYWORDS: Ambe Bahar, Chemical Fertilizers, Guava Gwalior-27

Received: Jan 22, 2017; **Accepted:** Mar 04, 2017; **Published:** Mar 08, 2017; **Paper Id.:** IJASRAPR201733

INTRODUCTION

Guava (*Psidium guajava* L), the apple of tropics is one of the most common fruit crop grown in tropical, sub-tropical and some parts of arid regions of India because of its low cost of cultivation, more tolerant to drought and semiarid conditions as well as salinity problems and wide adaptability to varying soil and climatic conditions. Since guava bears almost throughout the year, proper doses of nutrient application is considered essential for maintaining the productivity and good health of the tree. Emphasis should be as much on improving fertilizer use efficiency as also on its productivity, profitability, sustainability and eco friendliness. Therefore, without regular application of organic manure and recycling of crop residues it is not possible to maintain and sustain productivity. So, nutrient management practices involving organic and inorganic sources could prove very effective for achieving a cost effective and eco-friendly programme. The total area and production of guava in Madhya Pradesh is 22,500 hectares and 8.41 Lakh MT, respectively. Madhya Pradesh ranks first in productivity with 37.6 MT/ha. Guava shares 4.5 per cent of area and 3.3 per cent of production among fruit crops in India.

MATERIAS AND METHODS

The experiment entitled "Effect of inorganic nutrients and combine effect of inorganic and organic sources of nutrients on quality of Guava (*Psidium guajava* L.) cv. G-27 was conducted during 2014-2015 at the University

orchard farm, Department of Horticulture (Fruit Science), College of Agriculture, Gwalior (M.P.) with three replications. There were four levels of Nitrogen i.e., 600 g, 450 g, 300 g and 150 g., four levels of Phosphorus i.e., 400 g, 300 g, 200 g, 100 g, four levels of Potash i.e. 600 g, 450 g, 300 g and 150 g., plus 5 Kg vermicompost and 10 Kg FYM was applied to the per plants while the control plants received no fertilizer, inoculation and manure treatment. The methods employed during the course of investigation and materials utilized have great significance in the research programme. The whole of the organic manure was applied as a basal dose on the onset of monsoon. Then required doses of fertilizers were applied in two split doses in the month of July and August. For application of manure and fertilizers the top soil around the tree (equal to the leaf canopy of the tree) was dug up to 30 cm and the fertilizers were uniformly mixed into the soil, which was then levelled. Irrigation was applied immediately after fertilizer application. Observations on various quality parameters of fruit i.e fruit volume, no. of seed per fruit, seed weight, pulp weight, pulp: Seed ratio, TSS and acidity guava fruits with different treatments application were recorded. Quality parameters like total soluble solid (TSS) and acidity content of ripen fruits were analyzed following the methods described by A.O.A.C. (1970).

RESULTS AND DISCUSSIONS

Table 1: Effect of Different Treatment Combination on Chemical Parameters of Fruits

Treatment	Fruit Volume (ml)	No of Seed Per Fruit	Seed Weight (G)	Pulp Weight	Seed/Pulp Ratio
T0	139.97	240.00	6.40	134.44	0.05
T1	186.75	271.00	7.10	180.57	0.04
T2	167.04	255.33	6.82	168.25	0.04
T3	147.02	246.00	6.55	143.75	0.05
T4	143.92	243.33	6.50	141.32	0.05
T5	203.67	304.00	8.52	196.93	0.04
T6	196.78	290.00	7.63	190.02	0.04
T7	182.32	266.67	7.03	178.12	0.04
T8	160.27	253.67	6.72	165.37	0.04
T9	200.07	300.33	8.30	193.44	0.04
T10	190.88	278.00	7.50	187.27	0.04
T11	174.91	261.33	6.90	173.15	0.04
T12	156.23	251.33	6.60	154.69	0.04
SE(m)	4.47	3.86	0.17	4.12	0.00
CD(at 5%)	13.04	11.27	0.49	12.01	0.00

The data presented in Table-1 shows that number of fruits per tree was significantly influenced by integrated nutrient management (INM). The maximum fruits volume (203.67 ml) and pulp weight (196.93g) were found with the application of treatment T5 (N1P1K1V1), which is at par with T9, T6, T10 and minimum number of fruits volume (139.97 ml) and pulp weight (134.44) under T0 (control). No of seed per fruit (304.00), seed weight (8.52g) and Seed/pulp ratio (0.04) were found under the treatment T5 (N1P1K1V1) which was at par with T9, T6 and T10. The minimum no of seed per fruit (240.00), seed weight (6.40g) and were found with control (T0). The increase in pulp weight and fruit volume by the application of integrated nutrient treatments might be due to optimum supply of proper plant nutrients and growth hormones in right amount during the entire crop period caused vigorous vegetative development of the plants and ultimately production of more photosynthates. Phosphorus plays an important role in photosynthesis and accumulation of food material and Potassium in carbohydrate & protein synthesis and in the regulation of water relations. It may also act as a catalyst in the formation of more complex substances and in the acceleration of enzymatic activities which ultimately leads to improvement in physical characters of the fruit. Similar results have also been reported by Koen *et al.* (1990)

and Kundu *et al.* (2007) in guava.

Table 2: Effect of Different Treatment Combination on Quality Parameters of Fruits

Treatment	TSS	Acidity
T0	7.24	0.45
T1	10.46	0.43
T2	8.85	0.40
T3	8.14	0.42
T4	7.63	0.44
T5	11.17	0.22
T6	10.82	0.24
T7	10.34	0.26
T8	8.61	0.32
T9	11.07	0.23
T10	10.67	0.25
T11	10.26	0.28
T12	8.43	0.35
SE(m)	0.39	0.01
CD(at 5%)	1.14	0.02

The maximum TSS (11.17⁰ Brix) and minimum acidity (0.22) were found with the application of treatment T5 (N1P1K1V1), which is at par with T9, T6, T10 and minimum TSS (7.24⁰ Brix) and maximum acidity (0.45) under T0 (control). The improvement in various chemical characteristics by application of optimum dose of NPK may be explained by the fact that Phosphorus enters into the composition of phospholipids and nucleic acids, the latter combines with proteins and result in the formation of nucleoproteins which are important constituents of the nuclei of the cells. Potassium acts as a catalyst in the formation of more complex substances and in the acceleration of enzyme activity. These carbohydrates and coenzymes are beneficial in the improvement of fruit quality and Nitrogen enhances the uptake of Phosphorus and Potassium. The chain reactions in these components might have possibly been reason of the improvement in quality of the fruit. Similar results have also been reported by Wagh and Mahajan (1987), Ke-Lih Shang *et al.* (1997), Uma Shankar *et al.* (2002), Kundu *et al.* (2007), Kumar *et al.* (2008) and Kumar *et al.* (2009) in guava.

CONCLUSIONS

The results of present experiment for the 15 years old guava cv. G-27 shows that the treatment T5 (N1P1K1V1) has been most appropriate integrated nutrient dose under agro climatic conditions of Gwalior region for obtaining better quality of fruit.

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